

### REMARKS

The Official Action mailed January 10, 2006, has been received and its contents carefully noted. Filed concurrently herewith is a *Request for One Month Extension of Time*, which extends the shortened statutory period for response to May 10, 2006. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statement filed on January 20, 2004. However, the Applicant has not received acknowledgment of the Request for Corrected PTO 1449 Form filed on October 27, 2005 (received by OIPE on October 31, 2005). The Applicant respectfully requests that the Examiner provide an initialed copy of the Form PTO-1449 evidencing consideration of the *Request*.

Claims 1-16 were pending in the present application prior to the above amendment. Claims 2, 5, 6 and 12-16 have been canceled, claim 1 has been amended to better recite the features of the present invention, and new claims 17-32 have been added to recite additional protection to which the Applicant is entitled. Accordingly, claims 1, 3, 4, 7-11 and 17-32 are now pending in the present application, of which claims 1, 17 and 25 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 2 of the Official Action rejects claims 1, 2 and 7-16 as obvious based on the combination of U.S. Patent No. 5,258,323 to Sarma et al. and M. Bruel, "Silicon on insulator material technology," July 6, 1995, Electronics Letters, Vol. 31, Issue 14, pages 1201-1202. The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present application, as amended.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available

to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claim 1, as amended. Independent claim 1 has been amended to recite forming a silicon oxide film on a first single crystal silicon substrate; adding hydrogen to the first single crystal silicon substrate through the silicon oxide film to form a hydrogen added layer in the first single crystal silicon substrate; where trap levels and defects are generated due to a second heat treatment; forming a silicon island by patterning the single crystal silicon film after carrying out the second heat treatment; and thermally oxidizing the silicon island to reduce the trap levels and defects from the silicon island. For the reasons provided below, Sarma and Bruel, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

The present invention is directed to a method of manufacturing a semiconductor device, typically, the present invention relates to an improvement of a so-called Smart-Cut method. As explained in the present specification, for example, at page 8, line 15 to page 9, line 8, one of the important features of the claimed invention is that trap levels

and defects which are undesirably produced due to the high temperature process of bonding the first silicon substrate to a second substrate can be eliminated or reduced (if not completely eliminated) by the claimed thermal oxidizing step.

Claim 1 has been amended to positively recite that trap levels and defects are generated due to the second heat treatment and to clarify that the step of thermal oxidizing is performed to reduce these trap levels and defects. It should be noted that Sarma teaches that thermal oxidation is performed at the same time as the process for bonding the substrate, which allegedly corresponds to the claimed second heating step. Since there is no teaching or suggestion in Sarma and Bruel to perform a separate thermal oxidation step to reduce trap levels or defects, which are caused by a bonding step, the Applicant respectfully submits that the amended claims are patentably distinguished over the combination of Sarma and Bruel.

Also, the Official Action asserts that the "language of 'in order to eliminate trap levels and defects from the silicon island' is the intended use language" (page 8, Paper No. 0106). However, the above-referenced language does not appear to be a recitation of intended use as defined, for example, in MPEP § 2111.02. In any event, the Applicant has amended claim 1 and new claims 17 and 25 have been added, which recite thermally oxidizing a silicon island to reduce trap levels and defects from a silicon island. The Applicant respectfully submits that Sarma and Bruel do not teach or suggest thermally oxidizing a silicon island to reduce trap levels and defects from a silicon island.

Since Sarma and Bruel do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.


Paragraphs 4 and 5 of the Official Action reject dependent claims 3-6 as obvious based on the combination of Sarma, Bruel and U.S. Patent No. 5,387,555 to Linn et al. or U.S. Patent No. 6,455,401 to Zhang et al.

Please incorporate the arguments above with respect to the deficiencies in Sarma and Bruel. Linn or Zhang does not cure the deficiencies in Sarma and Bruel. The Official Action relies on Linn or Zhang to allegedly teach the features of the dependent claims. Specifically, the Official Action relies on Linn to teach a temperature range for thermal oxidation (page 6, Paper No. 0106) and on Zhang to teach an oxidizing atmosphere comprising a halogen element (pages 6-7, *Id.*). However, Sarma, Bruel and Linn or Zhang, either alone or in combination, do not teach or suggest performing a separate thermal oxidation step to reduce trap levels or defects, which are caused by a bonding step. Since Sarma, Bruel and Linn or Zhang do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

New claims 17-32 have been added to recite additional protection to which the Applicant is entitled. For the reasons stated above and already of record, the Applicant respectfully submits that new claims 17-32 are in condition for allowance.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

  
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